REMARKS

Upon entry of this amendment, claims 1 and 4-21 will be pending in the application, of which claims 1 and 17 are being amended, and claim 2 is being canceled.

Claims 1 and 17 are being amended to include the language of claim 2, which is being cancelled. Thus these claim amendments are fully supported by the Specification and add no new matter, and entry of the amendments is respectfully requested.

Double Patenting

Claims 1, 6, 8-10, 13-14, 11-12, 20-2, and 17 were provisionally rejected on the grounds of nonstatutory obviousness type double patenting as being unpatentable over claims 15, 19-21, and 23 of copending Application No. 11/221,169.

Upon allowance of the present application or Application No. 11/221,169, applicant will file a suitable Terminal Disclaimer to overcome this rejection.

Claim Rejections Under 35 U.S.C. § 103(a)

I. Claims 1-2, 4-5, 6-10, 14-16, and 18 were rejected as unpatentable over Weldon, et al., U.S. Patent No. 6,108,189, in view of Wang et al., U.S. Patent No. 6,538,872.

Applicant respectfully traverses the rejection. Independent claims 1, 6, 11 and 17, and the claims dependent therefrom, are patentable under 35 U.S.C. 103(a) over Weldon et al. in view of Wang et al., because the cited combination does not establish a *prima facie* case of obviousness. To establish a *prima facie* case of obviousness under 35 U.S.C. 103(a):

(a) The claimed invention must be considered as a whole;

(b) The references must be considered as a whole and must suggest the desirability and thus the obviousness of making the combination;

(c) The references must be viewed without the benefit of impermissible hindsight vision afforded by the claimed invention; and

(d) Reasonable expectation of success is the standard with which obviousness is determined.

Hodosh v. Block Drug Co., Inc., 786 F.2d 1136, 1143 n.5, 229 USPQ 182, 187 n.5 (Fed. Cir. 1986).

1. The Office Action Is Not Considering the Claimed Invention As a Whole

To establish obviousness, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). "All words in a claim must be considered in judging the patentability of that claim against the prior art." *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970). In determining the differences between the prior art and the claims, the question under 35 U.S.C. 103 is not whether the differences themselves would have been obvious, but whether the claimed invention as a whole would have been obvious. *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F. 2d 1530, 218 USPQ 871 (Fed. Cir. 1983).

Neither Weldon et al. nor Wang et al. teach or suggest claims 1, 6, 11 or 17, any one of which claims an electrostatic chuck comprising (i) an electrostatic puck comprising a ceramic body with an embedded electrode, the ceramic body having a substrate support surface with an annular periphery; and (ii) a base plate below the electrostatic puck, the base plate having an annular flange extending beyond the periphery of the ceramic body, the annular flange comprising a plurality of holes to allow connectors to pass therethrough, and the base plate comprising a composite of a ceramic material comprising pores that are at least partially filled by a metal.

As acknowledged by the Office Action, "Weldon does not disclose the base plate comprises a composite of the ceramic material comprising pores that are at least partially filled by a metal." In one version, Weldon et al. teaches an electrostatic chuck having a ceramic dielectric layer that is filled with a polymer:

> In another example, U.S. Pat. No. 4,480,284 discloses a chuck having a ceramic dielectric layer made by flame spraying Al_2O_3, TiO_2, or $BaTiO_3$ over an electrode and impregnating the pores of the ceramic layer with a polymer. (Weldon et al., Col. 2, lines 21-25.)

However, this described structure is that of the electrostatic chuck itself and not the base plate below an electrostatic puck, as presently claimed. Further, by teaching a structure comprising ceramic layer having pores that are filled with a polymer and not a metal, Weldon et al. teaches away from the base plate recited in the present claims, because the physical and chemical properties of a polymer are very different from those of a metal.

Furthermore, with regard to the base plate 105 which is below the electrostatic puck, Weldon et al. teaches that this base plate should be made from a metal. As shown in Figure 4b of Weldon et al., and further indicated by the single line hatching pattern of base plate 105 (which corresponds to a metal under MPEP drawing rules), the base plate in Weldon et al. consists entirely of a metal. Thus Weldon et al. does not teach a base plate comprising a composite of a ceramic material having pores that are at least partially filled by a metal, as claimed in claims 1, 6, 11, and 17.

Weldon et al. further does not teach a composite base plate comprising an annular flange having a plurality of holes to allow connectors to pass therethrough, as recited in claims 1 and 17; or having an annular flange having a plurality of holes that are shaped and sized to allow connectors to pass therethrough, as recited in claims 6 and 11. Instead, as shown in Fig. 2, Weldon et al. teaches a base plate 105 which is made of metal, and which has no annular flange extending beyond the circumference of structure of the dielectric member 115 and electrode 110 which rests on the base plate 105. In another version, shown in Fig. 4b, Weldon et al. teaches a base plate 105

having an annular flange made of metal and not a composite material, and which also does not have a plurality of holes to allow connectors to pass therethrough. Thus Weldon et al. does not teach claims 1, 6, 11, and 17 as a whole.

Wang et al. does not cure the deficiencies of Weldon et al., because even the combination of Wang et al. and Weldon et al. does not teach all the elements of claims 1, 6, 11, and 17. This is because Wang et al, also does not teach an electrostatic chuck comprising a composite base plate with an annular flange that extends beyond the periphery of an overlying ceramic body, and in which the annular flange comprises a plurality of holes to allow connectors to pass therethrough. As shown in Figs. 1, 2, 4a, 5, 6, and 7a-7c, Wang et al. does not teach a composite base plate with an annular flange that extends beyond the periphery of an overlying ceramic body, and which comprises a plurality of holes to allow connectors to pass therethrough. Instead, Wang et al. teaches a base plate 175, which does not have an annular flange with a plurality of holes to allow connectors to pass therethrough.

Thus the combination of Weldon et al. in view of Wang et al. does not teach claims 1, 6, 11, and 17 as a whole.

2. Weldon et al. in view of Wang et al. does not Motivate or Suggest the Desirability of the Suggested Combination.

Under the second part of the obviousness test, the combination of cited references, considered as a whole, must teach or suggest the desirability of the claimed subject matter. To establish a prima facie case of obviousness, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to combine the reference teachings. *In re Vaeck*, 947 F.2d 488 (Fed. Cir. 1991). See also MPEP § 2143 - § 2143.03.

The combination of Weldon et al., in view of Wang et al. does not motivate or suggest the desirability of the electrostatic chuck structure claimed in any one of

claims 1, 6, 11, and 17. As acknowledged by the Examiner, Weldon et al. does not disclose a base plate comprising a composite of the ceramic material comprising pores that are at least partially filled by a metal. Instead, Weldon et al. teaches an electrostatic chuck, and not a base plate having a ceramic dielectric layer that is filled with a polymer - not metal. By teaching the desirability of an electrostatic chuck comprising pores filled with a polymer which is very different physical and chemical properties than a metal, Weldon et al. teaches away from the structure of the base plate recited in the present claims, which has pores filled with metal.

Furthermore, the teachings of Weldon et al. to a structure comprising a ceramic with pores that are filled with a polymer are directed to the electrostatic member comprising the electrode. With regard to the base plate 105 below this electrostatic chuck member, Weldon et al. teaches a very simple structure comprising a base plate made entirely from a metal. Consequently, one of ordinary skill in the art upon reading in Weldon et al. that a base plate made from solid metal works well, would not be motivated to create a more complicated and expensive structure comprising a base plate made from a composite material. Nor would the person of ordinary skill in the art be motivated to derive a base plate structure comprising a ceramic having pores at least partially filled with metal upon reading from Weldon et al. about an electrostatic chuck structure comprising a ceramic having pores that are at least partially filled with a polymer, for the reasons explained above.

Nor does Weldon et al. teach a composite base plate comprising an annular flange having a plurality of holes to allow connectors to pass therethrough. Instead, as shown in Fig. 2, Weldon et al. teaches a base plate 105 made of metal , and which has no annular flange that extends beyond the circumference of structure of the dielectric member 115 and electrode 110 which rests on the base plate 105. In the version shown in Fig. 4b, Weldon et al. teaches a base plate 105 having an annular flange which does not have a plurality of holes to allow connectors to pass therethrough. Thus Weldon et al. does not teach a composite base plate comprising an annular flange having a plurality of holes to allow connectors to pass therethrough.

Thus, based on the teachings of Weldon et al., one of ordinary skill in the art would not be motivated to create a base plate made of a composite material as claimed, nor a base plate having an annular flange with a plurality of holes to allow connectors to pass therethrough. Accordingly, the teachings of Weldon et al. simply do not motivate derivation of the electrostatic chuck structure claimed in claims 1, 6, 11, and 17.

Wang et al. does not cure the deficiencies of Weldon et al., with respect to motivation because Wang et al. also does not teach an electrostatic chuck comprising a composite base plate with an annular flange that extends beyond the periphery of an overlying ceramic body, and in which the annular flange comprises a plurality of holes to allow connectors to pass therethrough. Throughout the Specification, and as demonstrated by the drawings of Figs. 1, 2, 4a, 5, 6, and 7a-7c, Wang et al. does not teach a composite base plate with an annular flange that extends beyond the periphery of an overlying ceramic body, and which comprises a plurality of holes to allow connectors to pass therethrough. Instead, Wang et al. teaches a base plate 175 without connector holes extending through an annular flange of the base plate. Thus Wang et al. teaches away from a base plate made from a composite material and which has an annular flange with a plurality of holes that allow connectors to pass therethrough.

Furthermore, forming connector holes that extend through a composite structure can be a difficult task when the composite material comprises a brittle ceramic material that can fracture during machining of such through holes. It much easier to form holes in a solid metal base of the type taught by Weldon et al. Consequently, one of ordinary skill in the art would have no motivation to form a plurality of connector holes in an annular flange of a base plate comprising a composite material composed of a ceramic with pores that are filled with the metal, as claimed, based on the combined teachings of Wang et al. and Weldon et al..

For these reasons, the combination of Weldon et al. in view of Wang et al. does not teach motivate derivation of the electrostatic chuck claimed in any one of claims 1, 6, 11, and 17.

3. The Electrostatic Chuck Structure Resulting from the Combination of Weldon et al. in view of Wang Does Not have a Reasonable Expectation of Success absent Hindsight Knowledge.

Furthermore, the electrostatic chuck structure that would result from the combination of Weldon et al. in view of Wang does not have a reasonable expectation of success without the knowledge derived from Applicant's own invention. Weldon et al. does not disclose a base plate comprising a composite of the ceramic material comprising pores that are at least partially filled by a metal. Instead, Weldon et al. teaches an electrostatic chuck having a ceramic dielectric layer having pores filled with a polymer and not metal. Deriving a base plate structure comprising a ceramic having pores filled with metal as claimed does not have a reasonable expectation of success based on the teachings of in Weldon et al. to an electrostatic chuck structure (not a base plate) comprising ceramic with pores that are filled with a polymer (not metal) and having an embedded electrode (which is not in the claimed base plate).

With regard to the base plate 105 below this electrostatic chuck member, Weldon et al. further teaches that the base plate is made entirely from metal. There is no reasonable expectation of success that a base plate made from solid metal can be substituted with a base plate comprising a composite of ceramic material having pores that are at least partially filled by a metal. These two base plate structures are entirely different from one another.

Furthermore, there is also no reasonable expectation of success that the combination of the overlying electrostatic chuck structure as taught by Weldon et al. with an entirely different base plate structure would actually work. Weldon et al. teaches an electrostatic chuck structure comprising a ceramic with pores that are filled

with a polymer with an embedded electrode. Weldon et al. further teaches that the electrostatic chuck structure should be supported by a base plate made entirely from a metal. In contrast, the Office Action suggests combining a different type of base plate with the electrostatic chuck structure taught by Weldon et al., namely, Applicant's claimed base plate which comprises a composite material comprising a ceramic having pores at least partially filled with metal. It may well be that such a combination may have problems result from different thermal expansion stresses, or other factors, that may result from the overlying electrostatic chuck structure which is a ceramic with pores filled with a polymer, and which has an electrode, and Applicant's base plate comprising ceramic with pores filled with a metal, because of the very different physical properties of polymer and metal, and the absence of an electrode in the claimed base plate.

Nor does Weldon et al.'s teachings to a base plate made from metal and without an annular flange having holes extending therethrough, be easily substituted with reasonable expectation of success with the claimed base plate, which has an annular flange made of the claimed composite comprising a ceramic material with pores that are at least partially filled by a metal, and which further has a plurality of holes to allow connectors to pass therethrough. Instead, Weldon et al. teaches a different type of base plate of metal, and which does not have an annular flange with a plurality of holes to allow connectors to pass therethrough.

The combination of Wang et al. and Weldon et al. also does not result in a structure having a reasonable expectation of success. Wang et al. does not teach a composite base plate having an annular flange that extends beyond the periphery of an overlying ceramic body, and which comprises a plurality of holes to allow connectors to pass therethrough in the annular flange. As explained above, it is difficult to machine holes through a brittle ceramic material, and even more so through one having pores, as the drilling or other machining methods can cause cracks to form between the pores, owing to the brittle nature of the ceramic material. Wang et al. does not teach a composite base plate with an annular flange that comprises a plurality of holes to allow connectors to pass therethrough. Instead, Wang et al. teaches a composite base plate

175 which does not have any connector holes in an annular flange. One should not be substituted for the other without teachings to the same.

For these reasons, the combination of the teachings Wang et al. and Weldon et al., do not provide a reasonable expectation of success of the claimed electrostatic chuck structure comprising an electrostatic puck and which has a base plate made from a composite material and having an annular flange with a plurality of holes that allow connectors to pass therethrough.

For these reasons, the electrostatic chuck claimed in any one of claims 1, 6, 11, and 17, is not obvious over the combination of Weldon et al. in view of Wang et al..

II. Claims 11-12, and 20-21 were rejected under 35 U.S.C. § 103(a) as being unpatentable under Weldon, U.S. Patent No. 6,108,189, in view of Wang et al., U.S. Patent No. 6,538,872 and Cole et al., U.S. Patent No. 6,700,099.

Claims11-12 are dependent upon claim 1 and claims 20-21 are dependent on claim 17. As explained above, claim 1 and 17 are not obvious over the combination of Weldon et al. in view of Wang et al. and Cole et al., because none of the references teach claim 1 or 17 as a whole, or motivate derivation of the claimed structure.

As acknowledged by the Office Action, Weldon et al. does not teach an electrostatic chuck comprising a base plate that includes a composite of the ceramic material comprising pores that are at least partially filled by a metal, as recited in claims 1 and 17. Instead, Weldon et al. teaches a base plate made from metal. Furthermore, Weldon et al. also does not teach a base plate comprising an annular flange made of a composite of a ceramic material with pores at least partially filled by a metal, and which further has a plurality of holes to allow connectors to pass therethrough as claimed in claims 1 and 17. Instead, Weldon et al. teaches a metal base plate 105 which does not have an annular flange with a plurality of holes to allow connectors to pass

therethrough. Thus Weldon et al. does not teach claims 1 or 17 as a whole, and does not motivate derivation of these claims, or the claims dependent therefrom.

Wang et al. does not cure the deficiencies of Weldon et al. because Wang et al, also does not teach an electrostatic chuck comprising a composite base plate with an annular flange that extends beyond the periphery of an overlying ceramic body, and in which the annular flange comprises a plurality of holes to allow connectors to pass therethrough as claimed in claims 1 and 17. Instead, Wang et al. teaches a base plate 175, which does not have an annular flange with a plurality of holes that allow connectors to pass therethrough. Thus Wang et al. does not teach any one of claims 1 or 17 taken as a whole, and does not motivate derivation of these claims, for the reasons provided above.

Cole et al. further does not cure the deficiencies of Weldon et al. in view of Wang et al., because Cole et al. also does not teach an electrostatic comprising, inter alia, an electrostatic puck comprising a ceramic body with an embedded electrode; and a composite base plate having an annular flange extending beyond the periphery of the ceramic body, the annular flange comprising a plurality of holes to allow connectors to pass therethrough, and the base plate comprising a composite of a ceramic material comprising pores that are at least partially filled by a metal, as recited in claims 1 and 17.

Instead, Cole et al. is cited for teaching a workpiece chuck that includes a thermal plate assembly comprising a cooling tube for circulating a cooling fluid. Cole et al. further teaches that the thermal plate assembly can include a housing made of a cast material such as aluminum. (Abstract, Cole et al.)

Thus Cole et al. does not teach an electrostatic puck comprising a ceramic body with an embedded electrode as claimed in claims 1 and 17. Nor does Cole et al. teach a base plate comprising a composite of a ceramic material comprising pores that are at least partially filled by a metal. Cole et al. also does not teach a composite base

plate having an annular flange extending beyond the periphery of the ceramic body and which comprises a plurality of holes to allow connectors to pass therethrough. Thus Cole et al. also does not teach claim 1 as a whole, even in combination with Weldon et al. in view of Wang et al..

For these reasons, the combination of Weldon et al. in view of Wang et al. and Cole et al. do not render obvious, claims 1 and 17, or claims 11-12 and 20-21 which respectively depend on claims 1 and 17.

III. Claims 13 and 17 were rejected under 35 U.S.C. § 103(a) as being unpatentable under Weldon, U.S. Patent No. 6,108,189, in view of Wang et al., U.S. Patent No. 6,538,872, and Flanigan et al., U.S. Patent No. 6,081,414.

Claim 13 is dependent on claim 11 and claim 17 is an independent claim. As explained above Weldon et al. and Wang et al. do not teach or suggest claims 11 or 17, because the cited references do not teach an electrostatic chuck comprising (i) an electrostatic puck comprising a ceramic body with an embedded electrode, the ceramic body having a substrate support surface with an annular periphery; and (ii) a base plate below the electrostatic puck, the base plate having an annular flange extending beyond the periphery of the ceramic body, the annular flange comprises a plurality of holes to allow connectors to pass therethrough, and the base plate comprising a composite of a ceramic material comprising pores that are at least partially filled by a metal, as recited in claims 11 and 17. Claim 11 further recites that the annular flange comprises a plurality of holes that are shaped and sized to allow connectors to pass therethrough.

Weldon et al. does not teach an electrostatic chuck comprising a base plate that includes a composite of the ceramic material comprising pores that are at least partially filled by a metal, as recited in claims 11 and 17. Instead, Weldon et al. teaches a base plate made entirely from metal. Furthermore, Weldon et al. also does not teach a base plate comprising an annular flange made of a composite and which has a plurality of holes to allow connectors to pass therethrough as claimed in claims 11

and 17. Instead, Weldon et al. teaches a different type of base plate, namely one made of metal and not a composite material, and which does not have an annular flange with a plurality of holes to allow connectors to pass therethrough. Thus Weldon et al. does not teach any one claims 11 or 17 taken as a whole, and does not motivate derivation of these claims, for the reasons provided above.

Wang et al. does not cure the deficiencies of Weldon et al. because Wang et al, also does not teach an electrostatic chuck comprising a composite base plate with an annular flange that extends beyond the periphery of an overlying ceramic body, and in which the annular flange comprises a plurality of holes to allow connectors to pass therethrough as claimed in claims 11 and 17. Instead, Wang et al. teaches a base plate 175, which does not have an annular flange with a plurality of holes that allow connectors to pass therethrough. Thus Wang et al. does not teach any one of claims 11 or 17 taken as a whole, and does not motivate derivation of these claims, for the reasons provided above.

Flanigan et al. also fails to make up for the deficiencies of Weldon et al. and Wang et al. because Flanigan et al. also does not teach or suggest a base plate comprising a composite made from a ceramic material having pores that are at least partially filled by metal. Instead, Flanigan et al. teaches an electrode or cooling plate between the electrostatic chuck and the pedestal, where the electrode or cooling plate is fabricated from a metal:

> An electrode 234 is disposed between the electrostatic chuck 105 and the pedestal 104. Specifically, the electrode 234 is disposed directly below the electrostatic chuck 105 inside the enclosure 208. Preferably, the electrode 234 is fabricated from a material that is a high conductor of RF power. In a preferred embodiment of the invention, the electrode has the form of a cooling plate 234 fabricated of a block of copper or stainless steel that is machined to a high degree of precision so that it fits and communicates with other enclosure components as described below.... the cooling plate 234 may be plated to prevent oxidation of the cooling plate material. Preferably, the plating material is

nickel. (Flanigan et al., Col. 6, lines 10-30.)

Thus, Flanigan et al. teaches a underlying cooling plate below the electrostatic chuck (or puck) that is a solid metal and not a composite comprising a ceramic material with pores at least partially filed with a metal. Further, Flanigan et al. does not teach or suggest a structure comprising a base plate composed of a ceramic material comprising pores at least partially filed with metal, as recited in amended claims 11 and 17.

Thus the combination of Weldon et al., Wang et al. and Flanigan et al. does not render obvious claims 11 or 17, or claim 13 which depends on claim 11.

CONCLUSION

Should the Examiner have any questions regarding the above remarks, the Examiner is requested to telephone Applicant's representative at the number listed below.

Respectfully submitted,
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